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COMPARISON OF DEVELOPMENT MODEL ON SELECTION ROUTE TRANSPORT NETWORK CITY KENDARI

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ABSTRACT

City Developments Contributed strongly to changes in land use activities and catches passengers along the route associated with transportation services and the range of existing stretch. The condition of public transport in the city of Kendari currently experiencing a condition that is Likely to impact negatively on the development of the City. This can be seen by the transportation route conditions can not reach all areas of administrative services in the City.

The results using the first two methods stated preference methods to Determine user preferences transport to public transport services that generate the data Reviews These is that 63.33% of passengers switched to using private vehicles to select the fastest route at a more affordable cost. Second, by using survey netode directly with generating traffic flow of data on five roads to the campus zone UHO produce models all or nothing at Y = 3015.091 - 32 455 X3, where X3 is Travel expenses are the which means less travel costs, the greater the flow on both sides of the trip. Variable costs as a parameter Determining the choice to generate opportunities for each road segment where the proportional stochastic models developed by Dial generate opportunities for 7:57 on Bunggasi Street, 6, 37 on Malaka Street, 5, 14, on MT. Haryono Street, 1.95 on Martandu Street and 1.72 on Laode Hadi Street.

The results of the analysis produces the best route choice models in Kendari with 5 samples UHO road to Campus zone is stochastic models Because It Gives an opportunity to every road with the travel costs as variable parameters.

KEYWORDS: All Or Nothing, Stochastic, Choice, Traffic, Route, Network

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Original Article

INTRODUCTION

Public transportation in the city of Kendari cause congestion on some roads in the city. Number of public transport vehicles that much on a single cause in addition to the load factor of the number of transport vehicles also dropped to the bunching or sticking together among each seize the vehicle, causing passenger causing disruption to traffic. In contrast to the other route, the number of existing transport especially during peak hours is very less and cause great headway, so that service users have to wait long to get public transport. Therefore the users on the route others prefer to use private transport modes.

At this time the movement of "demand" trips in the city of Kendari is a movement of "demand" drive the most congested in the Southeast. The tendency of road users through channels like a factor of growth on track previously not optimal, but the other will happen centralization new path so that the old path is not optimal anymore especially if the user's perception of the level of accessibility of the same, causing congestion recently on a new path The. Hence the need for research on determining the best model for the city of Kendari route selection in order

to be the basis for the development of transport and land use in the future.

LITERATURE REVIEW AND HYPOTHESES

Concept Modeling

Models can be defined as a tool or media that can be used to reflect and simplify a reality (the real world) is measured (Tamin, 2003), including:

- The physical model.
- The map and diagram (graphical).
- The statistical and mathematical models (equations).

The model can be used to reflect the relationship between the system of land use with transportation infrastructure system by using a series of function or equation (mathematical models).

Transportation Systems

The transport system is a system that has a function to move people and goods from one place to another in an attempt to overcome geographical distances and topographical barriers. Transportation has complex dimensions because it not only serves to move people or goods from one place to another but also involves other requirements, such as the need for economic, social and political.

Demand and Supply Transportation (Transportation Demand and Supply Analysis)

Analysis of transport demand is a process that is attempting to connect between the need for transport services with social and economic activities that give rise to the transportation needs (Miro 2005)

In the analysis of demand, transportation services requested amount is calculated the travel needs of the amount of traffic, while in the analysis of the bid, the number of transport services provided is a transport capacity of the transport vehicles, roads and terminal capacity, and the level of management quality management plus.

Accessibility

Accessibility is a concept that combines the system of land use geographically with transportation network connecting system. (Tamin, 2003). Accessibility is a measure of comfort or convenience of the way location in land use interactingeach other and "easy" or "dificulty" that location is achieved through a transportation system (Black in Tamin 2003).

Network and System Configuration

The public transport are defined as places where public transport is still serving passengers, that is by raising and lowering. Thus the route is a path that passed a public transport system. One route is usually a fixed trajectory of public transport regularly serve passengers, and on the other hand passengers using public transport on routes such.

Tamin (2003) explains that the system is in an urban route network is usually divided into two groups, namely:

- The route network is formed by evolution and carried out individually.
- The route network is formed thoroughly and simultaneously (together).

Route Choice

There are three hypotheses that can be used which produces kinds of different models:

- Traffic Assessment of an all-or-nothing
- Traffic Assessment Many-sections
- Traffic Assessment of chance

Traffic Assessment with a stochastic method of loading a model with a more realistic approach, where the assumption that each route has an opportunity to be selected.

RESEARCH METHODS

Research Design

This study basically want to have a relationship model to optimize the use of public transport on the basis of the concepts of service of transport route and distance of travel. On the concept of the public transport services contained several principles modeling of transportation mode choice and route selection, which is basically caused by a number of variable factors such as comfort, reliability, operating costs and the time and distance of travel. With reference to the provisional hypothesis that the preferences of road users prefer the shortest route that can save time and travel costs.

Based on these conditions, this study using quantitative analysis techniques that are produced the concept for the selection of the best models for urban transportation route. Mathematical model and the model map into an analytical tool meant to describe a model for the relationship of various categories are defined as variables to model the relationship between variables that effect.

There are two categories of relationships which will be formulated in the design of this study is finding how the tendency of road user preferences in determining the choice of the best route. Second, how to model the best route selection in the city of Kendari.

Model Used

The model for the proposed route selection is a model based on user preferences or opinions perpetrators transport. Route choice models in question are:

- Model all or Nothing
- Stochastic Models
- Comparison and merging models all or nothing and stochastic models.

Data Collection Technique

In this study data collection, several ways in which to get the data thoseare:

- Survey observations, namely direct observation. Observational data that is needed is the data traffic of public transport service, both existing and those not yet in operation. Data capture point (points) with navigation aids (GPS) and taking a motor vehicle along the route trajectory get troughperformed by one to complete 17 routes route.

- Survey by questionnaire, survey is necessary to obtain information on the areas public transportation service (microbus) stretch existing in Kendari, conducted to obtain the condition of the current role of public transport. Public transport operator (driver) is considered as a party that knows public transport operations, both available as well as the development effectiveness of these passengers.
- Survey tendency route selection (route) to determine the dominance of urban transportation routes these vehicles both existing as public transport (existing) and private transportation route that is often used with consideration of the distance and cost of travel.

The delivery and collection of questionnaires that will be used is to be delivered and taken directly from the respondents (delivered to the respondent / collected from respondents).

Data Analysis Technique

The analytical method used, among other things: to produce the best model among the models all or nothing with the stochastic model in route selection is done by using quantitative analysis technique such as regression analysis and for analysis of models of the selection of routes and modes of transport that is carried out by using quantitative analysis in the form of analysis chi square (cross-classification analysis) and then describe all the information and present it to the maps, graphs and tables.

Use of these models use data matrix Origin Destination (OD) that focuses attention on the imposition of the route. MAT is an update to see the amount of movement caused by land use activities. Route selection is related to the distance between land use and a raised road users attracted towards the goal zone. Then use probability analysis and linear regression analysis is needed as an error in the modeling.

RESULTS AND DISCUSSIONS

Traffic Assessment Network with All or Nothing Models

Imposition by using the all or nothing model is done by using the data results of the field observations in the form of a data traffic flow. The approach of the algorithm used once or cascade method. This approach is done on the basis of ease of obtaining the data traffic flow in the nodes traveling from zone i to destination zone d.

Initial perceptions about the fastest route based on this method is based on the data irregularities that many public transport route deviates from the actual trajectory. Trajectory deviation based on the following data.

In general, the activity most dominatedby passengers traveling to and from the location of education (66.67%) and office (16.67%). Passengers traveling on Route IIA (Mall Mandonga - Puuwatu) still dominated trips originating from the terminal and on Route IIIA (New Market - Tondonggeu) by traveling from the market.

From the interview, 63.33% microbus operators expressed a decline in passenger numbers of urban transportation. Most (56.67%) said that the decline was caused by the growing number of users of private vehicles and 36.67% due to the competition with a motorcycle taxi (ojek). 6.67% while the operator stating there was an increase (on Route III G) due to the operation of Provincial General Hospital in Baruga. Of the revenue generated, only 30% of operators stated that they were favorable trajectory, 66.67% said enough and 3.33% said less profitable. Mostoperators (40%) around this by choice not to operating at off-peak hours (off-peak periods), usually around 09.00 until 12:00 and 14:00 until 16:00. Some states continue to operate along the route (50%) and some are still operating but when passenger liability, passed to other public

transportation then pivoted or waiting passenger(10%).

Table 1: Development of Passenger and Advantages Route

Passengers tendency	Responden	Percentage
a. Tends to Rise	3	10 %
b. Ordinary	8	26,67 %
c. Tend Descending	19	63,33 %
Amount	30	100 %
Causes Passenger Trends		
a. Private Vehicle	17	56,67 %
b. Motorcycle Taxi (Ojek)	11	36,67 %
c. Other	2	6,67 %
Amount	30	100 %
Advantage Route	Res	Persentase
a. Profitable	9	30 %
b. Enough Profitable	20	66,67 %
c. Less Profitable	1	3,33 %
Amount	30	100 %

Source: Interview Operator Microbus (2013)

The reduced transport use public transport due to the tendency of the passengers have chosen to use private vehicles as well as some of the reasons of convenience either by public transport users as well as by public transport owners. Tended to move public transportation route based on interviews with 16 public transport operators trajectory deviation data obtained data indicate that the need for expansion of routes / public transportation route. From interviews respondents then as much as 56.67% of respondents want the expansion of the trajectory range, while the remaining 43.33% thought unnecessary or are satisfied with the existing service coverage.

The survey results showed a tendency to take the route of the entire sample of vehicles with the assumption that the direction taken in the Campus 2 types of trips node each node is traversed by the currents coming from different zones. Of some dominant node in a different direction subsequently taken some samples of riders as the respondent to determine the path of the reasons presented in the following table.

Table 2: Reason Covered the Route in La Ode Hadi Street and Bunggasi Street

Traffic Volume	Determinant Variable			
	Distance	Travel Time	Travel Cost	Other
668	61	97	86	-
581	84	72	75	-

Source: Results of interview (2014)

To produce the model, the use of statistical parameter values will help find models in all or nothing. Parameter linear regression results in the imposition of the model generated by using a factor of distance, time and travel expenses.

Rated R for 1,000 ≈ 100%
Coefficient Y = 3015.091
Coefficient X3 (cost) = -32 455

Regression analysis generated by the data generating significant relationship between variables but weak. Total travel costs can explain his relationship with the flow of traffic as a consideration in selecting the best route. Models produced at all or nothing are: Y = 3015.091 - 32 455 X3, where X3 is a travel cost. The smaller the cost of travel, the

greater the flow of traveling on both sides of it.

Route Assignment with Stochastic Models

Route assignment with Stochastic Model is based on the perception of motorists on travel expenses resulting in a journey with many routes. Selection of the stochastic model-proportioned with a greater probability on a shorter route. The possibility of route selection r resolved by the model as follows:

$$prob\ (r) = \frac{exp(-1.t_r)}{\sum_{r=1}^{N} \exp(-a.t_r)} . \quad (1)$$

Prob (r) = chance of selecting the route rtr = travel time on the route r
N = the number of route alternatives
a = parameters to be calibrated

Data generated on the basis of observations on some roads in the following table:

Table 3: Determinant Variables

Traffic Volume	Determinant Variables			
	Distance	Travel Time	Travel Cost	Other
668	61	97	86	-
581	84	72	75	-
278	41	58	63	-
216	55	32	51	-
152	42	28	39	-

Source: Result of Field Observation (2014)

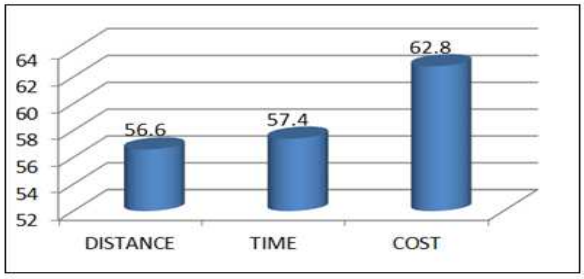

Figure 1: Percentage of Route Selection Factor

Comparison of these elections determinants generated through direct interviews at each road segment either by public transport operators and passengers produces more dominant factor travel time of the distance factor and costs, but the overall determining factor is influenced by the route selection fee of 62.8%.

In determining the results of the stochastic model-proportional cost factors are considered more representative of the other factors (distance and time) because the cost factor is the implication of the change in distance and time. Assuming that the greater the distance and time it will have an impact on travel costs. Thus the cost factor as a parameter in determining the probability value (r) the choice of the best route for each road to the campus zone.

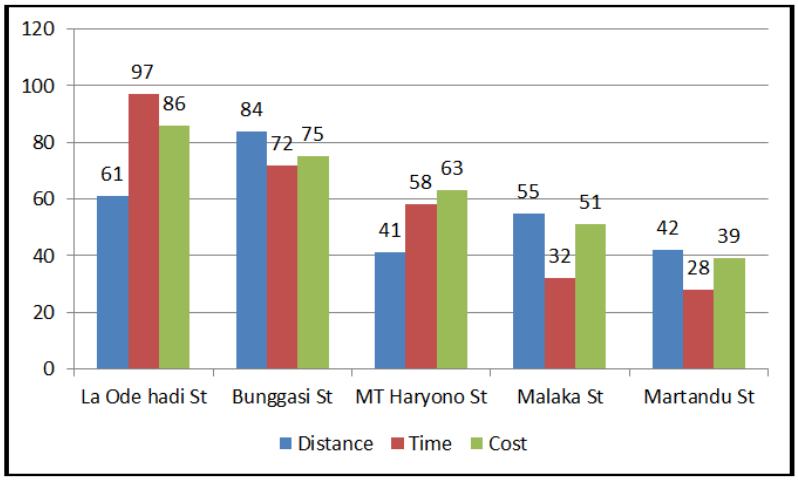

Figure 2: The Result of Interview Respondents about Factors Route Selection

Variation factors route selection for each road section describes the service conditions. On the road of Laode Hadi from the direction of BWK 1 distance factor is more dominant than the other two factors because these roads is one alternative to the campus zone. At Bunggasi road the time factor is more dominant because these roads often run into the side barriers. While on the MT Haryono road cost factors into consideration in selecting the best route. In the other two segments of the road Malaka and Martandu Road each have the same percentage which is dominated by a range of factors in choosing the best route.

Opportunities for every road segment burdened public transport flows derived from probability equation above is presented in the following table:

Table 4: Probability (r) Selecting the Best Route

Street	Volume	t_r	N	a	r
Ld Hadi	668	25	8	86	1,72
Bunggasi	581	30	11	75	7,57
MT. Haryono	278	35	10	63	5,14
Malaka	216	20	2	51	6,37
Martandu	152	20	5	39	1,95

Source: Result of Analysis

Number of alternatives are likely to affect the chances of the best route for each direction toward the destination zone. In the above table the greater the alternative route to the best route to the destination node to the greater chance of choosing the route. These are the best with the greatest chance at Bunggasi road with a probability value (r) = 7.57 which has an alternate route as much as 11 routes. Based on the results of the preliminary survey, the Bunggasi a road network that connects various types of land uses contained in BWK 5 Kendari consisting of residential zones, trade zones, and some secondary education zone.

Some others have the same opportunities as in the Malaka been selected travel time faster than several other roads to the campus zone. Opportunity of Martandu road (r) are 6.37 indicates that the majority of road users from the direction BWK 5, BWK 4, 3, 2 and 1 chosen this path for reasons of travel time or avoid traffic conditions on roads other.

MT. Haryono road which is the main road from the central CBD Kendari city has the third largest opportunity value of (r) 5.14 by the number of alternate route as much as 10. However this street every day to experience congestion combined with delays at traffic light but it is the shortest route from multiple route Other linking the CBD with Campus zone, so that a dense residential zones around roads MT. Haryono still choose this route as the best route.

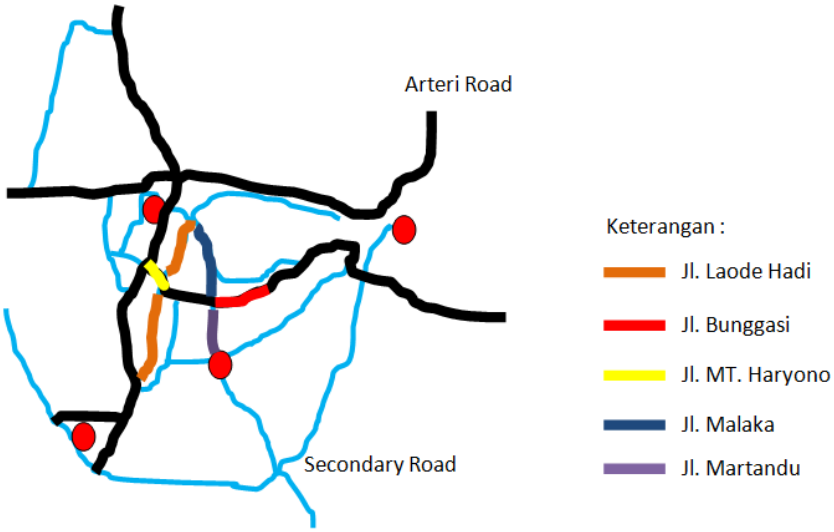

Figure 3: The Best Route, Output of Stochastic Model

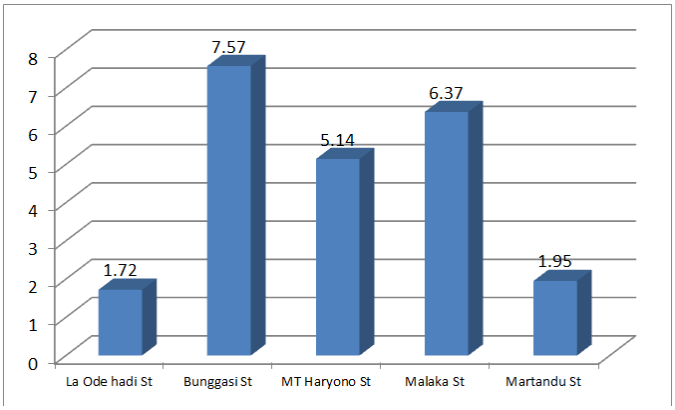

Figure 4: Probability Index Option Campus Route to the Zone

Comparison Model

Model calibration results between models all or nothing with the stochastic model, there are some differences but basically the result of mutually reinforcing assumptions were obtained.

In the model all or nothing gained a model with variable costs as variables that influence the choice of users to find the best route, but in this case there is only one best route will be selected.

While the stochastic model - proportionate, taking into account the costs generated by the model all or nothing into the parameters used to determine the best route for any road used by users to the campus zone. Then the best model to determine the best route is a stochastic model with the assumption that each route has an equal chance to be selected as the best route.

CONCLUSIONS

Based on the research that has been done we can conclude several things:

- The tendency of the best route selection in Kendari based on the fastest route at minimal costs.
- The effect of distance on route selection just dominated on the Bunggasi Road, MalakaRoad and Martandu Road, dominated by the influence of time on the LaodeHadiRoad while the cost factor dominated in the MT. Haryono.
- The best model on a public transport route selection in the city of Kendari is proportional Stochastic models developed by Dial with consideration of every opportunity to be elected as the best route.

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